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**Southeast Fisheries
Science Center**

Data-Rich Stock: Western North Atlantic Short- finned Pilot Whale Stock Assessment

Southeast Fisheries Science Center
Protected Species Program Review

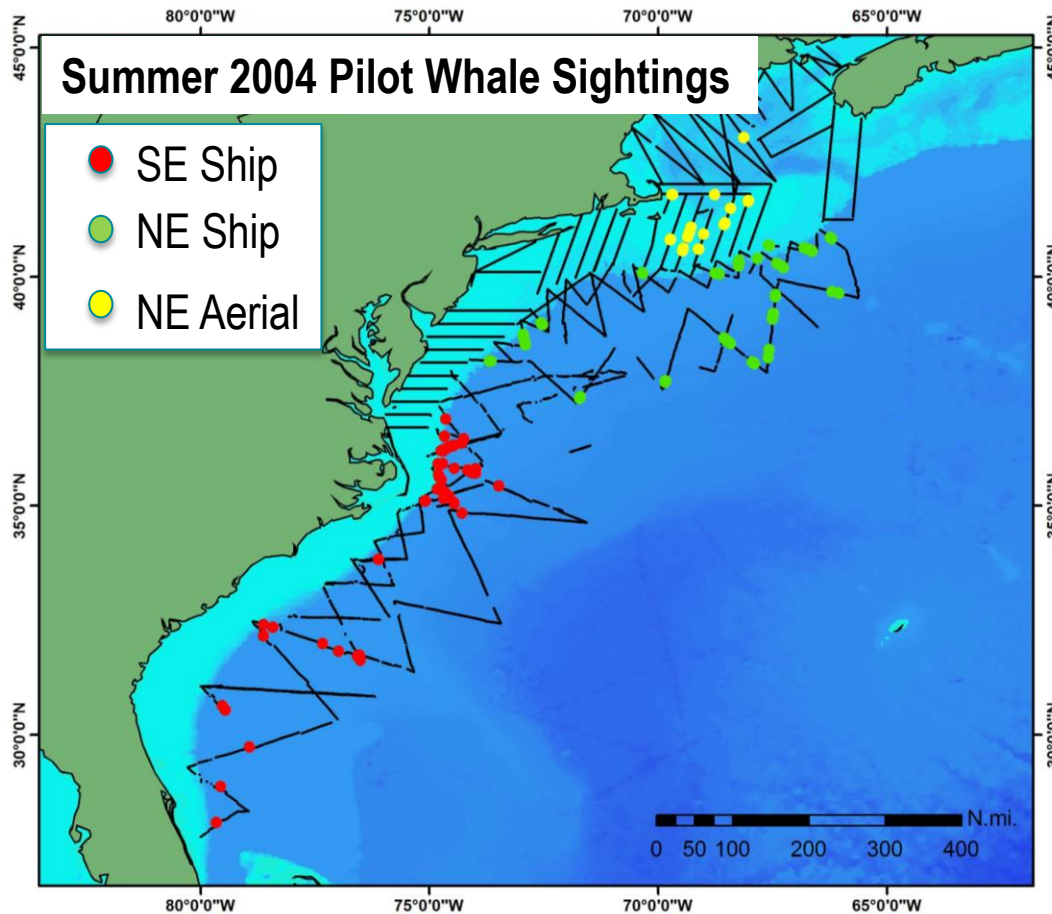
August 25-27, 2015

Background – Pilot Whales on the East Coast

- Short-finned and long-finned pilot whales
 - Difficult to differentiate at sea
 - Overlap in mid-Atlantic
- Serious injuries and mortalities in pelagic longline and trawl fisheries
- Mortality estimates exceeded PBR
- Lawsuit settlement prompted formation of Pelagic Longline and Atlantic Trawl Gear Take Reduction Teams

Improving the Stock Assessment: Abundance

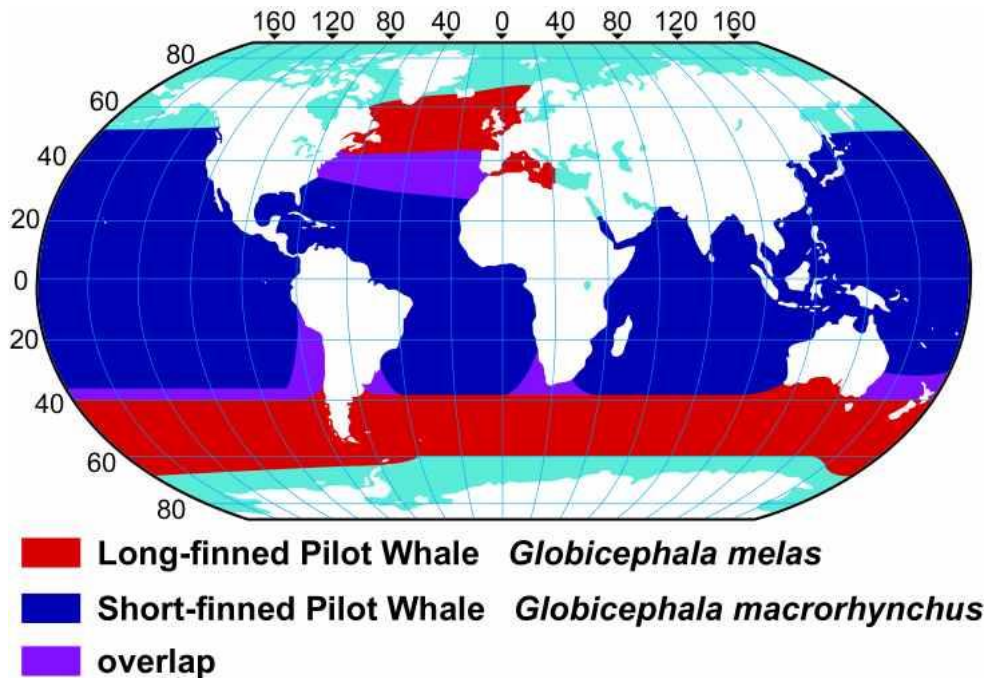
- Expiring abundance estimate – previous survey was in 1998



- Summer 2004 vessel and aerial surveys by SEFSC and NEFSC
- Employed two-team methods for the first time (SEFSC)
- Abundance estimate increased from 14,524 (PBR = 108) to 31,139 (PBR = 249)
- Mortality no longer exceeded PBR

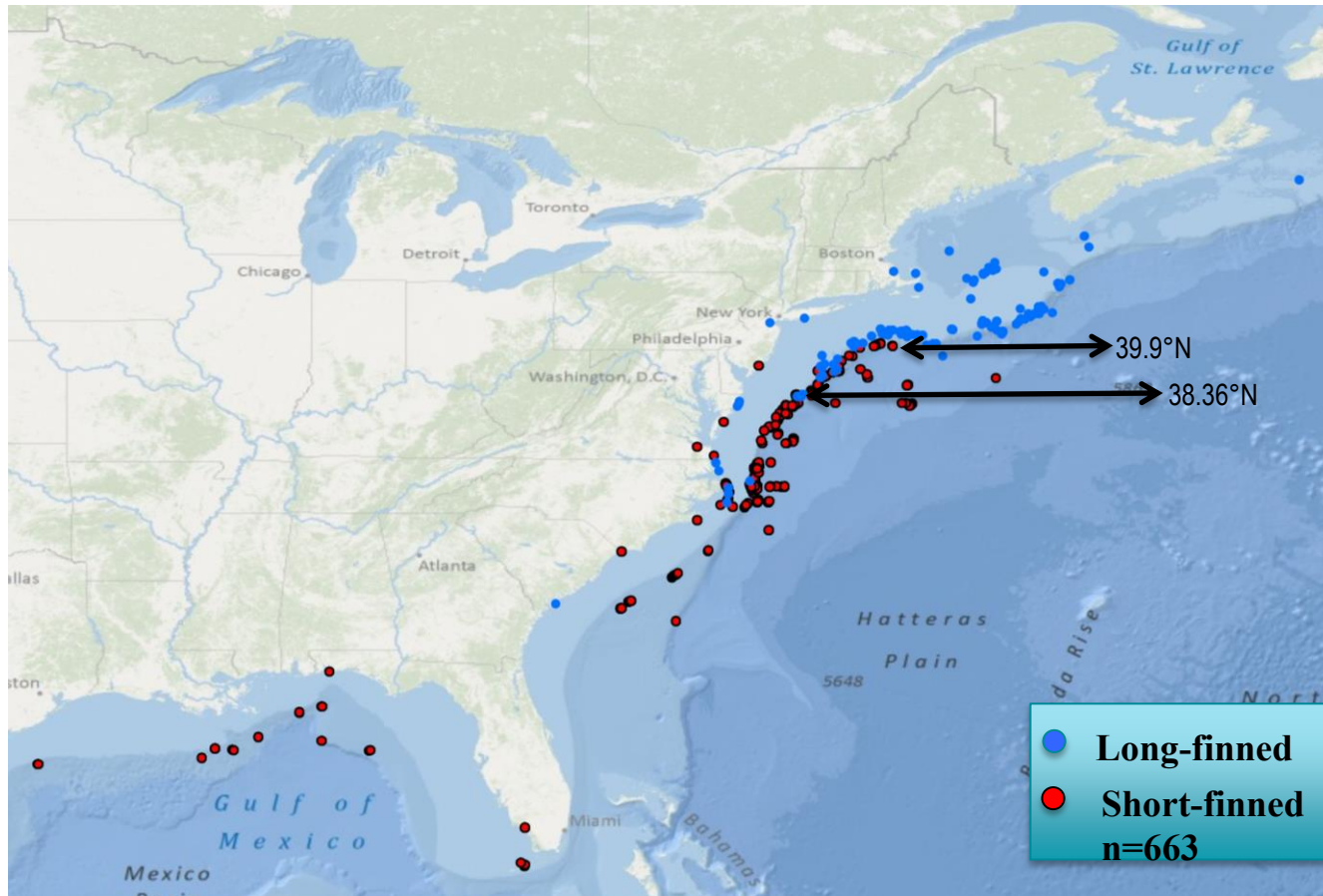
Improving the Stock Assessment: Distribution and Stock Delineation

- Mortality and abundance estimates were combined between two species



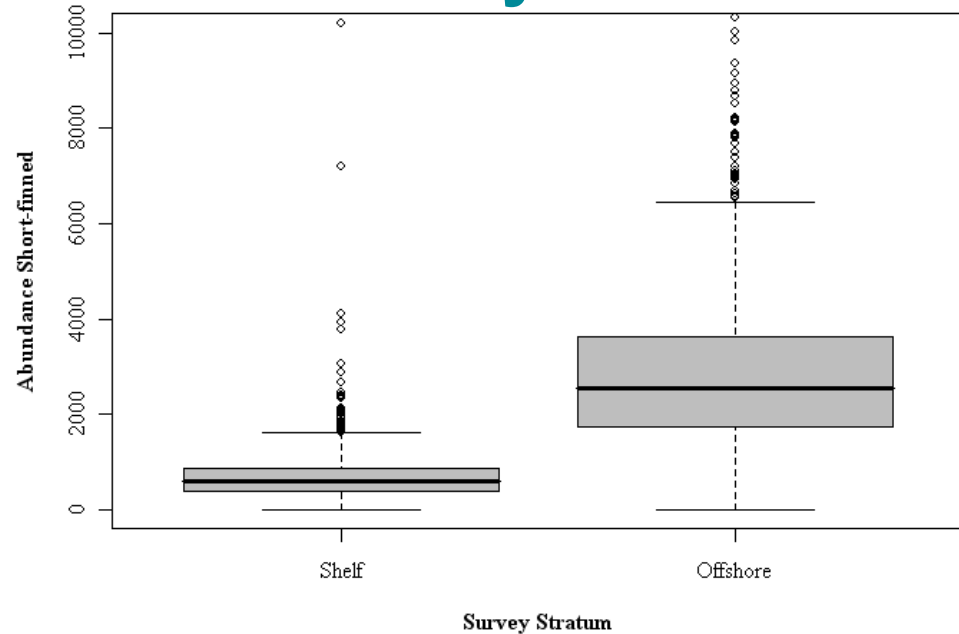
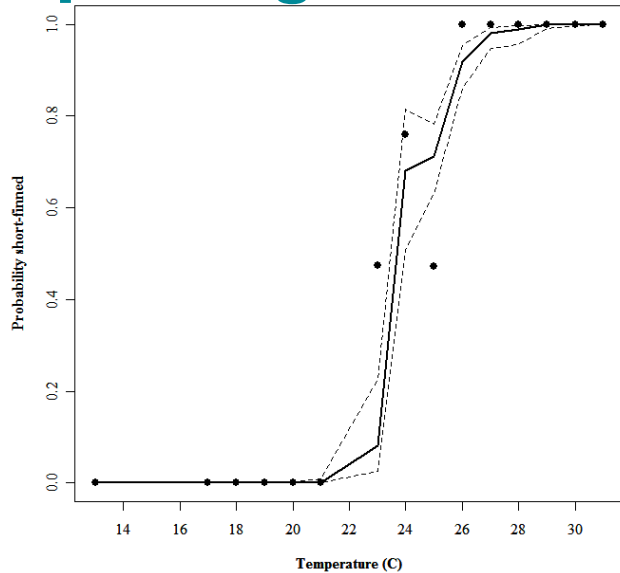
- Known area of overlap in region with highest bycatch
- Stock delineation between Gulf and Atlantic uncertain
- Genetic markers used to distinguish species from biopsy samples

Improving the Stock Assessment: Distribution and Stock Delineation

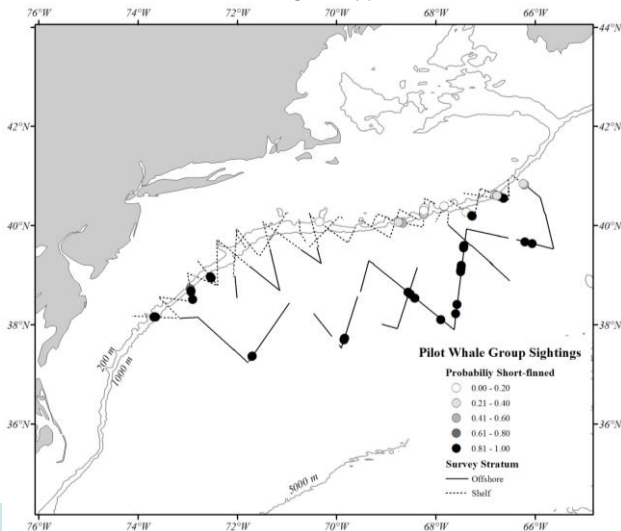


- Samples from bycaught and stranded animals
- Dedicated pilot whale biopsy surveys in summer 2005-2007, follow on in fall 2011

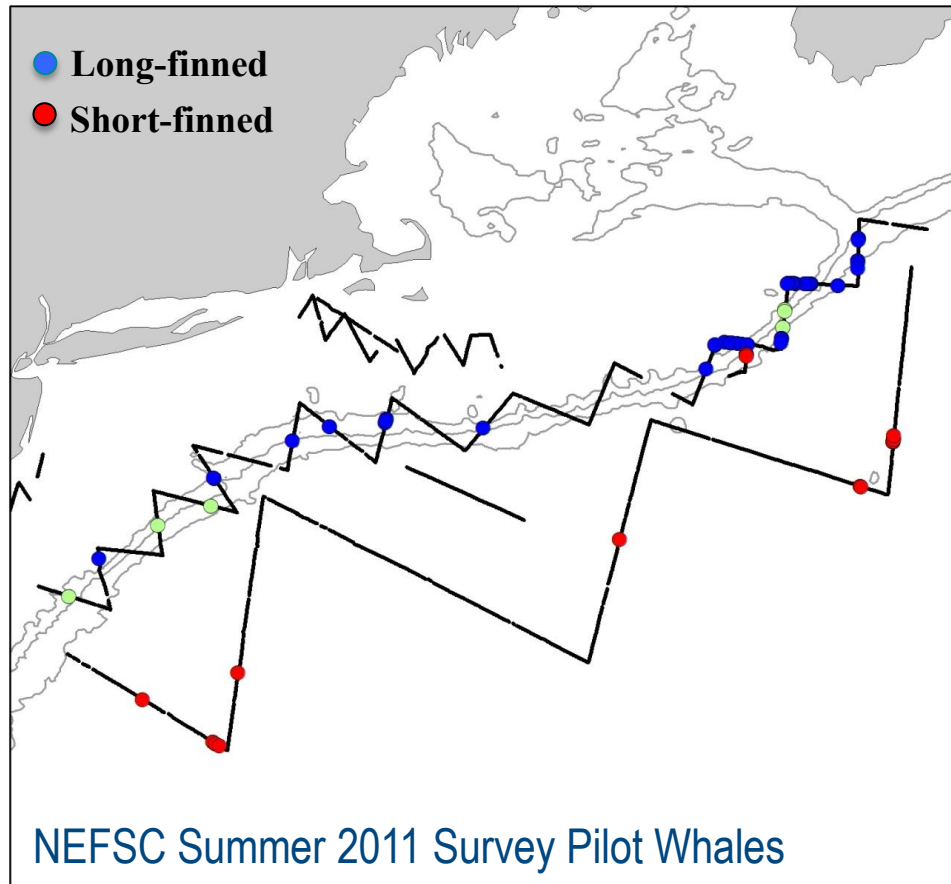
Improving the Stock Assessment: Splitting Abundance and Mortality Estimates



- Logistic regression model showed strong effect of water temperature
- SE surveys were of short-finned pilot whales
- NE shelf break vessel surveys were “mixing zone”

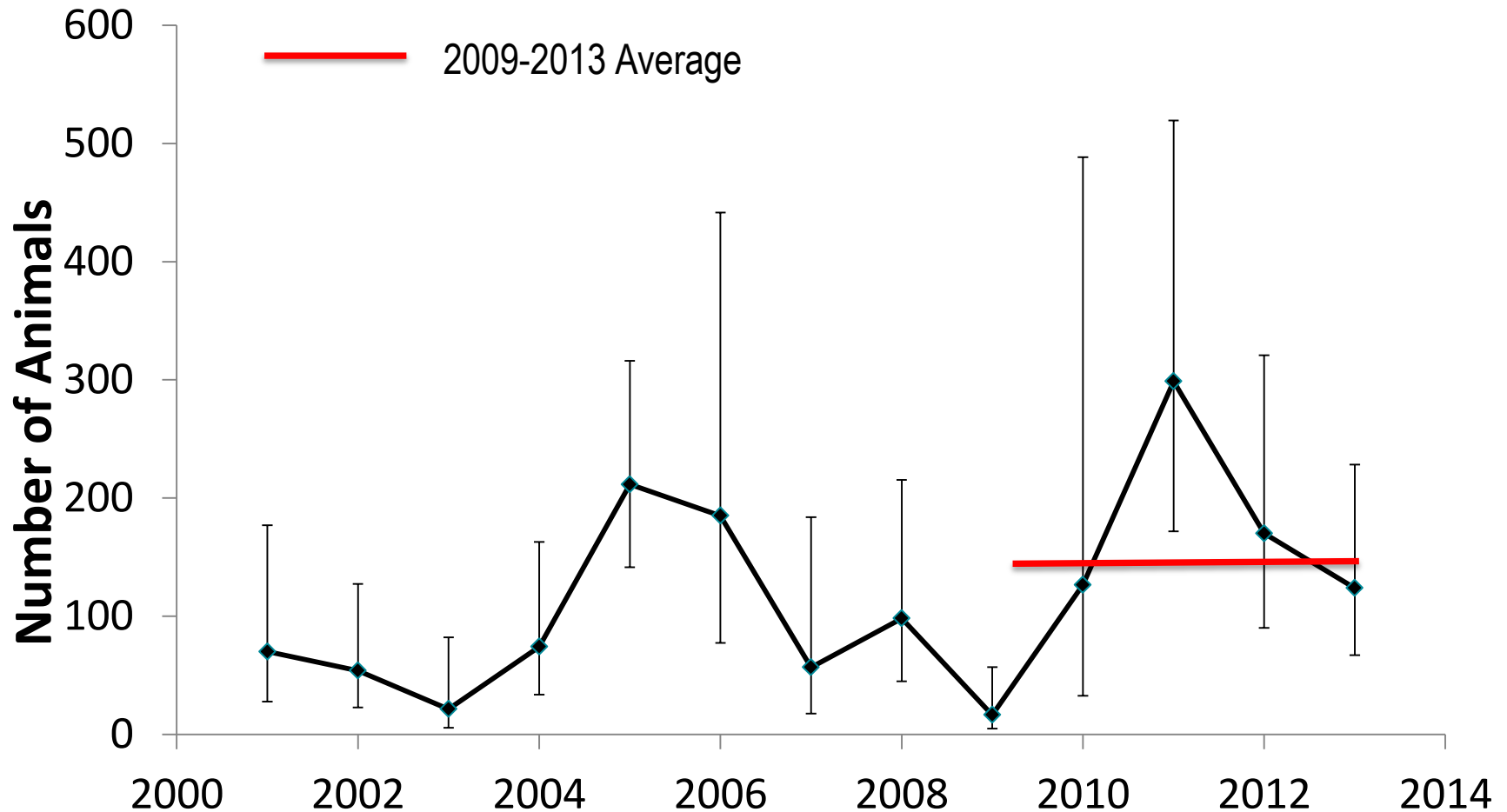


Improving the Stock Assessment: Splitting Abundance and Mortality Estimates



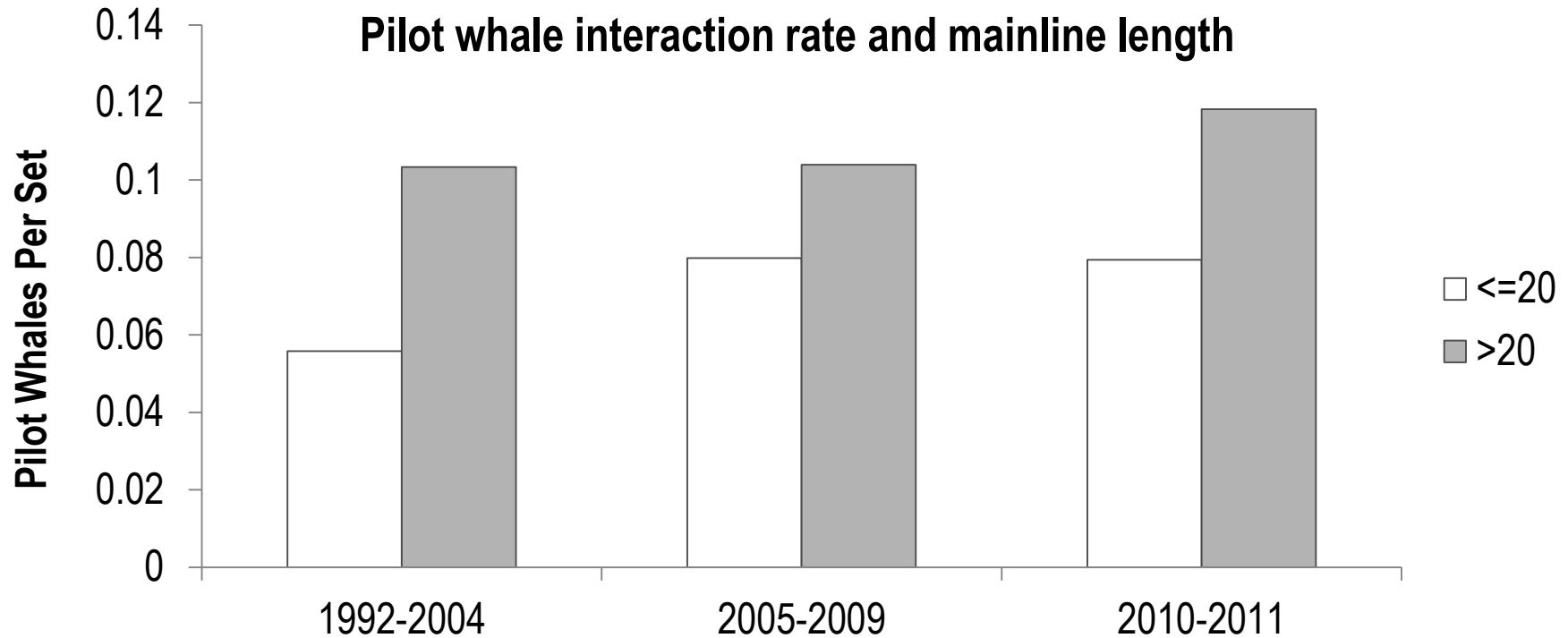
- Abundance estimate updated with 2011 AMAPPS survey
- Pelagic Longline mortality estimates split between species in most recent SAR
- Short-finned Abundance = 21,515 (PBR = 159), Mortality and Serious Injury = 148 (2009-2013)

Annual Pilot Whale SI and Mortality: 2001-2013



Annual Average M&SI of Short-finned pilot whales: 148 (CV = 0.201)

Pelagic Longline Take Reduction Team: Evaluating Management Options

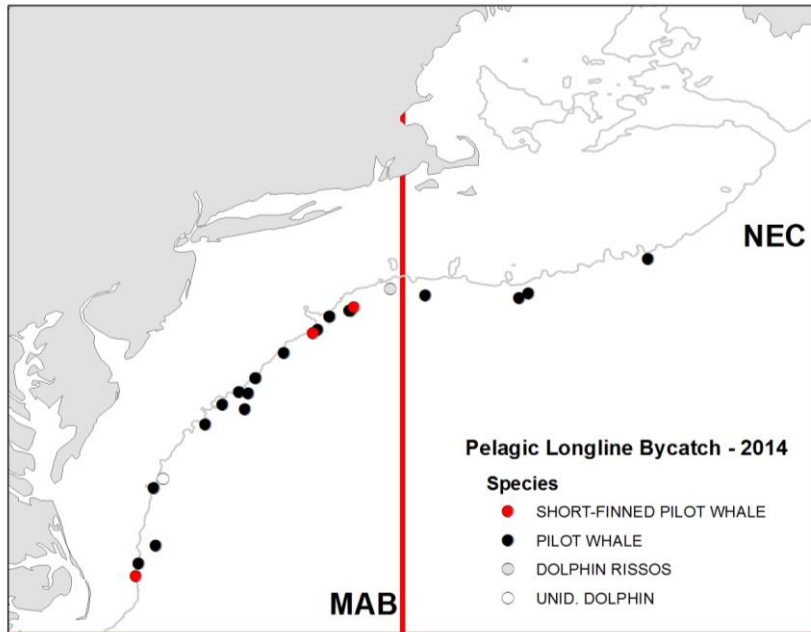


Analysis of gear characteristics and fishing practices indicated mainline length affected pilot whale interaction rates.

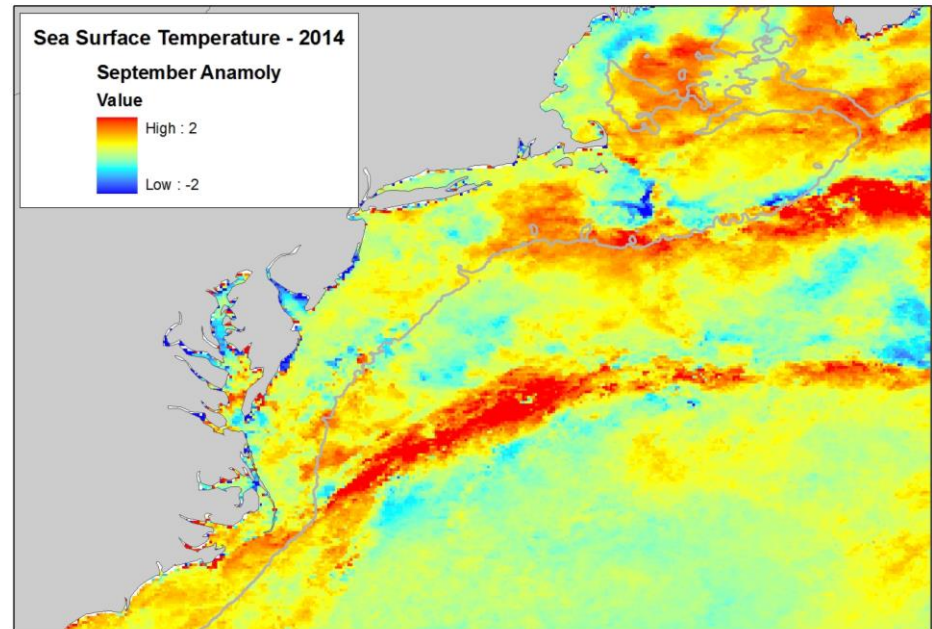
Resulted in a regulation mandating mainline lengths <20 nautical miles in the Mid-Atlantic Bight Fishing Area.

Environmental Variation and Interactions

Pelagic Longline Interactions with Pilot Whales - 2014



Sea Surface Temperature Anomaly for September 2014 compared to 2002-2014



In 2014, interactions occurred further north than in prior years

Associated with warmer than average temperatures

Distribution of the fishery, target species, and pilot whales are all environmentally driven

Outcomes

- Updated and improved abundance estimates
 - Temporary funding in 2004 and AMAPPS funding in 2011 allowed updated abundance surveys
 - Next survey (AMAPPS) planned for 2016
- Dedicated biopsy efforts and genetic analyses allowed separation of species
- High observer coverage and reliable logbook data allowed exploration of management alternatives
- Effective take reduction team developed management actions and regulations

Challenges

- Compliance with mainline regulation has taken time, and effectiveness is not clear
- Some gaps in observer coverage – particularly during first and second quarter
- Cyclic changes in pilot whale interaction rate

Future Directions

- PLTRT continuing to work on alternatives
- Ongoing studies to address PLTRT research priorities
- Habitat models from AMAPPS studies will provide additional seasonal information
- Forthcoming changes in management will effect the fishery